THURSDAY, JUNE 9, 1910.

HANDBOOKS ON THE FRESH-WATER FAUNA OF GERMANY.

Die Süsswasserfauna Deutschlands, eine Exkursionsfauna. Herausgegeben von Prof. Brauer (Berlin). i., Mammalia, Aves, Reptilia, Amphibia, Pisces, by P. Matschie, A. Reichenow, G. Tornier, P. Pappenheim. Pp. iv+206; 173 figs. Price 5 marks. iii. and iv., Coleoptera, by E. Reitter. Pp. 235; 101 figs. Price 5 marks. v. and vi., Trichoptera, by G. Ulmer. Pp. 326; 467 figs. Price 6.50 marks. vii., Collembola, Neuroptera, Hymenoptera, Rhynchota, by R. and H. Heymons and Th. Kuhlgatz. Pp. 112; 111 figs. Price 2.40 marks. viii., Ephemerida, Plecoptera, Lepidoptera, by Fr. Klapálek and K. Grünberg. Pp. 163; 260 figs. Price 4 marks. ix., Odonata, by F. Ris. Pp. 67; 79 figs. Price 2 marks. x., Phyllopoda, by L. Keilhack. Pp. iv+112; 265 figs. Price 3 marks. xi., Copepoda, Ostracoda, Malacostraca, by C. van Douwe, E. Neresheimer, V. Vávra, and L. Keilhack. Pp. 136; 505 figs. Price 3.50 marks. xii., Araneæ, Acarina, and Tardigrada, by F. Dahl, F. Koenike, and A. Brauer. Pp. 191; 280 figs. Price 4 marks. xvii., Parasitische Plattwürmer, i., Trematodes, by M. Lühe. Pp. iv+217; 188 figs. Price 5 marks. xix., Mollusca, Nemertini, Bryozoa, Turbellaria, Tricladida, Spongillidæ, Hydrozoa, by J. Thiele, R. Hartmeyer, L. von Graff, L. Böhmig, W. Weltner, and A. Brauer. Pp. 199; 346 figs. Price 4 marks. (Jena: Gustav Fischer, 1909.)

THE aim of the editor of these volumes has been to provide a *complete* systematic account of the fresh-water fauna of Germany. In addition to the parts named above, others, on the Diptera, Oligochæta and Hirudinea, Rotatoria and Gastrotricha, Nemathelminthes and Cestodes are promised in the near future; a volume on the Protozoa is not at present in preparation, but may be forthcoming later. There are already other accounts which deal with portions of the fresh-water fauna, the organisms therein considered being selected either because they are the commonest fresh-water animals or because of their special interest from a biological or morphological point of view. But in the volumes before us *all* the known species of each group of fresh-water animals are considered; thus the worker is given the means of identifying any organism he may have under examination provided that it has been already recorded from fresh water in Germany. Whatever piece of work the fresh-water naturalist may desire to undertake, whether it be the study of the life-history of certain animals, their distribution, their behaviour under different conditions of environment, or whether it be the intensive study of the fauna of one pond or the more general study of the fauna of a more extended area, one of the first things necessary will be the determination of the systematic position of the organisms he proposes to investigate. For the first time the naturalist is provided, in this series of handy volumes, each written by a specialist or group of specialists, with the means of identifying his specimens with the minimum of difficulty and trouble, and without the necessity of consulting expensive monographs. The descriptions and diagnoses given are thoroughly trustworthy and practical; they contain the principal morphological characters, and short biological and faunistic notes are added in many cases. These handbooks are not intended to supply, and do not give, lengthy anatomical or biological accounts of the organisms; their function is to enable the worker who consults them to identify his material as speedily as possible. To this end keys are provided, wherever possible, to the families, genera and species, and figures, for the most part in line, are given to illustrate the diagnostic characters.

As there are no definite boundaries between the fresh-water, terrestrial, and marine faunas, it is difficult to decide whether certain animals should or should not be regarded as coming within the scope of these volumes. The editor has included not only animals which live in or upon fresh water, but those which are found on the margins of ponds, lakes, streams, &c., entering into intimate association with the water; others which seek the water only temporarily have been excluded. On the whole, the limits of the fresh-water fauna have been liberally interpreted. In order to give a more complete account, mention has been made in some cases of developmental stages of organisms, although these stages do not actually occur in fresh water; for instance, the larvæ—Leptocephali—of the eel are mentioned and figured. Our knowledge of some divisions of the fresh-water fauna is at present in a very imperfect condition; the adult forms of many animals are well known, while their younger stages are but inadequately described. These volumes, which will reach the hands of the majority of serious workers, will fulfil the purpose, among others, of serving as a record of our present knowledge, and will show the lacunæ which remain to be filled by future observations.

Heft i. deals with the whole of the vertebrates found associated with fresh water in Germany. The treatment of the Amphibia may be instanced as an example of the method adopted in this volume. A table of the diagnostic characters of adult Urodeles is given, by means of which *Salamandra maculosa, Molge alpestris, palmata, cristata,* and *vulgaris* may be distinguished. In the following part, which deals with the Batrachia, there are tables for the identification of (1) the fully adult frogs, *Hyla arborea, Bufo viridis, vulgaris,* and *calamites, Rana temporaria, arvalis,* and *esculenta* (three varieties), *Bombinator pachypus* and *igneus, Pelobates fuscus,* and *Alytes obstetricans*; (2) their spawn; (3) the young tadpoles with external gills; and (4) older tadpoles with internal gills. The third table is accompanied by the suggestion that it should be used only in case of those specimens which die in this comparatively early stage of development, and that it is preferable, wherever possible, to keep the tadpoles alive until the fourth table can be applied, with more certainty, to their identification. These four tables are illustrated by

forty figures, which clearly show the features upon which the diagnosis depends.

Hefte iii. and iv. form a single volume on the Coleoptera. The introductory pages contain useful figures, on which the structures used in diagnosis are named. The order is divided into Adephaga (Carnivora) and Polyphaga; then follow tables for the separation of the families, genera, and species. The true water beetles, that is, those species in which all stages are passed in water, are first considered; afterwards, those species in which the young stages are found in water, the adults being terrestrial; and, finally, those the whole life of which is passed under stones or on plants on the margin of water.

The single volume on the Trichoptera (Hefte v. and vi.) opens with a detailed description of the imago, following which are tables, supported by line figures, chiefly of wings and genitalia, for the separation of families, genera, and species. Six pages are devoted to the description of the egg masses of some families, genera, and species, and there follows a detailed description of the larva and tables for separating larvæ into their respective families, genera, and species. Lastly the pupa is described, and another series of tables enables the worker to identify the family or subfamily to which a pupa belongs, and he may then complete the identification either by reference to the genitalia of the imago (if they are already formed beneath the pupal cuticle) or to the larval cuticle. These excellent systematic accounts ot the larvæ and pupæ, which occupy 112 pages, are alone sufficient to secure for the volume a hearty reception and commendation.

The volumes on the other orders of insects (Hefte vii., viii., and ix.) are on a plan similar to that of the two volumes above noticed, as also are the accounts of the Crustacea. For instance, the Phyllopoda (Heft x.) are divided into Euphyllopoda and Cladocera, each section being in turn subdivided into families, genera, and species, separate tables being given, where necessary, of the characters of male and female specimens. Two hundred and sixty-five outline drawings of the carapace, terminal hooks, setæ, antennæ, &c., make clear the references to these characters in the text.

The account of the Trematodes (Heft xvii.) is admirably arranged and complete. Tables giving the characters of the adult, and in some cases also of immature forms, are provided. There are lists of the Trematodes which have been found encysted in those birds, Amphibia, fishes, molluscs, and arthropods which are associated with fresh water, and there is a useful appendix on cercariæ. The utility of the volume would be increased if a "host-index" were added, by means of which the worker could ascertain what parasites had been recorded from the particular host which he happens, at the moment, to be examining.

The numerous figures, many of them original, which illustrate these volumes are of exactly the kind to elucidate the text; only very rarely is a defective figure met with; here and there a shaded drawing has become rather too dark in the course of reproduction, thus causing part of its detail to be obscured. The generic and specific names adopted are thoroughly up to date. Synonyms are given in only a comparatively few cases, such as those in which a well-known name has been recently superseded; a few more cases would have been the better for similar treatment; for instance, such well-known names as Paludina and Cyclas might have been given as synonyms under Viviparus and Sphærium respectively. One regrets the disappearance of many well-established names, *e.g.* Apus is replaced by Triops, and the alteration of others, *e.g.* Daphnia to Daphne, Anodonta to Anodontites, Artemia to Artemisia; these changes in zoological nomenclature seem to be almost endless, and sometimes, as in the last-named case, to be of doubtful value.

The volumes are of handy size, about 8 inches by 4½ inches, suitable for the pocket; they are printed on thin paper, so that the largest (on the Trichoptera, 326 pp.) is only half an inch in thickness.

So considerable a proportion of the fresh-water fauna of Britain is found also in Germany that the student of the British fresh-water fauna may turn to these volumes with the assurance that, in most cases, he will find there the information he requires to enable him to identify his material. These excellent volumes are certain to prove of the greatest service to workers on the fresh-water fauna, not only of Germany, but of a wider area.

CRETAN ARCHÆOLOGY.

Crete, the Forerunner of Greece. By C. H. Hawes and Harriet Boyd Hawes. With a preface by Arthur J. Evans. Harper's Library of Living Thought. Pp. xiv+158. (London: Harper Bros., 1909.) Price 2*s.* 6*d.* net.

MRS. HARRIET BOYD HAWES, better known to us, perhaps, under her maiden name of Miss Harriet Boyd, and her husband, Mr. C. H. Hawes, have written a very useful little book which may be described as a short, popular description of the antiquities of Crete which have been discovered during the last ten years by Dr. Evans, Prof. Halbherr, and by the distinguished author herself. More popular than Prof. Burrows's admirable "Discoveries in Crete" (though, at the same time, in no way less useful to archæologists), and published at half the price of even his book, "Crete, the Forerunner of Greece," should bring the interest and the importance of the Cretan discoveries home to the minds of all. Mr. and Mrs. Hawes have rightly insisted on the fact that the Cretan discoveries should in reality interest us more than similar discoveries in Assyria, or Palestine, or even in Egypt, because the Cretan civilisation of the Bronze age was the forerunner and the ancestor of that Hellenic culture which is ours to-day. In spite of the dark age of mediævalism in Europe, the tradition of Græco-Roman civilisation survived, and we have now returned to it. Greek culture was but a revival, after an analogous dark age of mediævalism, of the great civilisation of the Ægean Bronze age, younger sister, probably, of the ancient culture of the Nile valley. Our civilisation goes back in Greece to the very beginning of things, almost to